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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,794	04/19/2001	Ying Chen	ARC20000088US1	2559

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George H. Gates
Gates & Cooper
Howard Hughes Center
6701 Center Drive West, Suite 1050
Los Angeles, CA 90045

EXAMINER	
NANO, SARGON N	

ART UNIT	PAPER NUMBER
2157	

DATE MAILED: 09/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/839,794	CHEN ET AL.	
	Examiner	Art Unit	
	Sargon N Nano	2157	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 April 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *15 Oct 2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is responsive to the application filed on April 19, 2001. Claims 1 – 42 are pending examination.

Claim Objections

1. Claims 1 and 29 are objected to because of the following informalities: missing of the word "and" at the end of line 11 of both claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to clearly understand the claim. The word "moding" is not clearly explained in the specifications.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims , 10, and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter which applicant regards as the invention. For examining purposes the claims are interpreted as best understood by examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 7, 9, 10, 11, 12- 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christy U.S. Patent No. 6725264 in view of Kalkunte et al. U.S. Patent No 6535510.

As to claim 1, Christy teaches a method of providing a single system image in a clustered environment comprising:

assigning an internet protocol (IP) address as a cluster IP address (see col.3, lines 48 – 52, col. 8 lines 52 – 57 and fig. 4, Christy teaches the assignment of IP address to a cluster commander);

binding the cluster IP address to a node in a cluster (see col. 3, lines 9 – 17, Christy teaches the binding of a cluster IP address to a node by assigning each device in a cluster a unique identifier) ;

receiving a client request directed to the cluster IP address(see col. 3 lines 27 – 32, Christy teaches the receiving of request by information exchange between management console and devices in cluster);

filtering the request based on a dynamically adjustable workload distribution function, wherein the function is configured to allow a single node to process the client request (see col.4 line 59 – col. 5 line 9, Christy teaches filtering by forwarding the frame to a particular port) ;

obtaining a response to the request (see col.6 line 40 – col. 5 , line 9 Christy teaches obtaining a respond to a request that is sent by NMS) ;

inserting a cluster media access control (MAC) address into the response (see col.12 lines 2 – 9 and fig.2 and fig. 8 Christy teaches the insertion of MAC address by sending identification MAC address of a port and forwarding request to a cluster and receiving responses from member switches to management station) ;

sending the response from the single node to the client (see col. 12 lines 10 – 15 , Christy teaches sending the response from a node to a client where a member device processes a request and sends a response back to management control).

Christy does not explicitly teach the claimed limitation of multicasting the request.

Kalkunte teaches that the request is multicast to a trunked group (see col. 3 lines 42 – 45 and fig.4).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify Christy by sending the request as multicast to enable high speed transfer of significant data to a subgroup .

As to claim 2, Christy teaches the method of claim 1 further comprising informing other nodes in the cluster of the cluster IP address and a media access control (MAC) address associated with the node that is bound to the cluster IP address (see col.3 lines 9 – 24, Christy teaches the IP address of the cluster commander despite the fact that each device in a cluster has its own identifier).

As to claim 3, Christy teaches the method comprising:

(a) forming a virtual local area network (VLAN) comprising (see col. 3 lines 14 – 27. Christy teaches the virtual network by assigning IP address to a cluster):

(1) a master node wherein the master node is the node that is bound to the cluster IP address (see col.8 , lines 47 – 56 and fig. 4, teaches the commander node as the master node that is assigned an IP address for the entire cluster) ;

(2) at least one network interface for each node in the cluster (see col.10 lines 9 – 19 Christy teaches interfaces of devices or nodes to the media); and

(b) wherein multicasting comprises packet forwarding and processing the client request from the master node to the other nodes in the VLAN (see col. 4 , lines 50 – 58 Christy teaches forwarding the frame to all devices on the network).

As to claim 4 Christy teaches the method of claim 1 further comprising:

forming a multicasting group comprising all of the cluster nodes; and wherein the multicasting comprises automatically multicasting the request to all of the cluster nodes in the multicasting group (see col.4, lines 50 – 58 Christy teaches the request is sent to all cluster nodes) .

As to claim 5, Christy teaches the method 4 wherein the multicasting group is formed by setting the MAC addresses of network interface cards of nodes in the cluster to be a multicast MAC address (see col.4 lines 50 – 58 and fig.2 , Christy teaches the media access control interface for each port on the Ethernet therefore the nodes in the cluster are MAC addresses).

As to claim 6, Christy teaches the method of wherein the MAC addresses are set by setting a first bit of a first byte to a certain value (see col.4 lines 29 – 34 and fig.2 Christy teaches the receiving of MAC data bit stream and setting the first bit of first byte to a certain value is a design choice).

As to claim 7, Christy teaches the method wherein the workload distribution function is installed in a driver on each node in the cluster (see col.3, lines 9 – 24 Christy teaches the SNMP that allows cluster devices to run their own tasks that are assigned by commander device).

As to claim 9, Christy teaches the method wherein the response is sent from the single node to the client without multicasting (see col.3, lines 25 – 32 Christy teaches the response is sent from a cluster device to a client).

As to claim 10, Christy teaches the method wherein the workload distribution function distributes the workload by moding a source IP address with a number of nodes in the cluster (see col. 9, lines 19 – 41 Christy teaches the

management of all the devices in a cluster and network management communication with cluster devices is performed using IP address assigned to commander device).

As to claim 11, the method of claim 1 wherein the workload distribution function distributes the workload by:

representing a total workload observed by the cluster as a bitmap with a number of bits k (see col.5 lines 15 – 34 Kalunkunte teaches the number representation of bitmap which determines all the ports the packet should be set to) ;

obtaining a bit m by moding a source IP address of the client by the number of bits k (see col. 5 lines 41 – 60 , Kalunkunte teaches the IP address assignment to a packet received at the ingress) ; and

assigning the client request to a cluster node that has a specified value at bit m (see col. 4 lines 65 – col. 5 line 3, Kalunkunte teaches the assignment of port destination based on bit value of the opcode in the header of the packet).

As to claim 12, Christy teaches the method the workload distribution function distributes the workload based on workload statistics that are periodically collected by at least one cluster node (see col. 6, lines 4 – 10, col. 6, lines 40 – 47 and fig. 3A, Christy teaches the management of all devices in a single cluster and the facilitation of exchange management information among network devices).

As to claim 13, Christy teaches the method wherein cluster nodes periodically exchange workload statistics information (see col.6, lines 40 – 66,

Christy teaches the communication SNMP agent and SNMP manager where the information is used to perform operations).

As to claim 14, Christy teaches the method further comprising:

adjusting a number of nodes in the cluster (see col.10, lines 53 – 59, Christy teaches the adjusting number of nodes in a cluster to sixteen devices) ;

recomputing a workload distribution based on the number of nodes in the cluster (see col. 10 , lines ,53 – 59 Christy teaches the recomputing of workload based on failed devices in a network) ; and

redistributing the workload among nodes in the cluster based on the recomputation (see col.10 lines 59 – 65, Christy teaches the redistributing of workload in a cluster by replacing the commander device).

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Christy U.S. Patent No. 6725264 in view of in view of Kalkunte et al. U.S. Patent No 6535510 and in further view of Vepa et al. U.S. Patent No 6560630 .

As to claim 8, Christy and Kalkunte do not explicitly teach the claimed limitation of " the workload distribution function filters the client request based on workload distribution and whether a packet header of the client request indicates that destination MAC and IP addresses are the cluster IP and cluster MAC addresses ".

However, Vepa et al. U.S. Patent No. 6560630, teaches the incoming data packet received , where the packet is sent to a final destination depending on MAC address and network address using load-balancing scheme (see col.2 , lines 49 – 61).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify Christy and include the workload distribution because by doing so will provide fault tolerance and allow optimal scalability performance.

As per claims 15 – 42, they contain similar limitations as claims 1 – 14, therefore are rejected under similar rationale.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Combining Virtual Local Area Networks And Balancing With Fault Tolerance In A High Performance Protocol by Vepa et al. U.S. Patent No. 6,590,861.
- System And Method For Load Balancing by Primak et al. U.S. Patent No. 6,389,448.
- Automatic Load Sharing For Network Routers by Wils et al. U.S. Patent No.6,397,260.
- Client- Based Dynamic Switching Of Streaming Servers For fault Tolerance And Load Balancing by Goldszmidt et al. U.S. Patent No. 6,195,680.
- Packet Relay Control Method Packet Relay Device And Program Memory Medium by Lmai et al. U.S. Patent No.6,175,874.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sargon N Nano whose telephone number is (703) 305-4651. The examiner can normally be reached on Monday – Friday from 8:30 – 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (703) 308- 7562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sargon Nano
Patent Examiner/Art Unit 2157
8 /31/ 04

SALEH NAJJAR
PRIMARY EXAMINER